Gulf Cooperation Council

EDICT OF GOVERNMENT

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GSO 2114 (2011) (English): MOTOR VEHICLES REAR UNDERRUN PROTECTIVE DEVICES FOR TRUCK AND TRAILER AND ITS METHODS OF TEST (Draft Standard)

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هيئة التقييس لدول مجلس التعاون لدول الخليج العربية
GCC STANDARDIZATION ORGANIZATION (GSO)

مشروع: نهائي

GSO2/FDS/ECE 58: 2009

السيارات - حواجز الحماية الخلفية للشاحنات والمقطورات وطرق اختبارها

MOTOR VEHICLES
REAR UNDERRUN PROTECTIVE DEVICES FOR TRUCK AND TRAILER AND ITS METHODS OF TEST

إعداد
اللجنة الفنية الفرعية الخليجية لقطاع مواصفات المركبات والإطارات

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تقديم

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وقد قامت هيئة التقييس لدول مجلس التعاون لدول الخليج العربية ضمن برنامج عمل اللجنة الفنية رقم2-1 " اللجنة الفنية الخليجية الفرعية لقطاع مواصفات المركبات والإطارات " بإعداد المواصفة القياسية الخليجية رقم "GSO2/DS/ECE 58: 2009 " السيارات - حواجز الحماية الخلفية للشاحنات والمقطورات وطرق اختبارها " من قبل سلطنة عمان وقد تم إعداد المشروع بعد استعراض المواصفات القياسية العربية والأجنبية والدولية والمؤلفات المرجعية ذات الصلة.

وقد اعتمدت هذه المواصفة كمواصفة قياسية خليجية في اجتماع مجلس إدارة الهيئة رقم ( )، الذي عقد بتاريخ / / هـ ، الموافق / / م.

Foreword

Standardization Organization for GCC (GSO) is a regional Organization which consists of the National Standards Bodies of GCC member States. One of GSO main functions is to issue Gulf Standards /Technical regulation through specialized technical committees (TCs).

GSO through the technical program of committee TC No. 2-1 " The Gulf technical Subcommittee for vehicles and tyres standards " has prepared this Standard . The Draft Standard has been prepared by sultanate of Oman.

The draft Standard has been prepared based on relevant ADMO, International and National foreign Standards and references.

This standard has been approved as Gulf Standard by GSO Board of Directors in its meeting No..../.... …….held on / / / H , / / G

MOTOR VEHICLES
REAR UNDERRUN PROTECTION IN TRUCK AND TRAILER AND ITS METHODS OF TEST

1- SCOPE AND FIELD OF APPLICATION

This standard is concerned with the requirements for the rear underrun protective devices (RUPD) of trucks and trailers having maximum mass exceeding 3.5 tones used for the carriage of goods. This standard does not apply to Traction units for articulated vehicles, special trailers constructed for the carriage of very long loads such as timber, steel bars etc.

2- COMPLEMENTARY REFERENCES

2.1 GSO 159/.1993.... "Motor Vehicles - Weights and Dimensions".

2.2 GSO 48/.1984.... "Motor Vehicles - Conformity Certificates".

3- DEFINITIONS

3.1 **Unladen mass:** The mass of the vehicle in running order, unoccupied, and unladen but complete with fuel, coolant, lubricant, tools and spare wheel.

3.2 **Maximum mass:** The mass stated by the vehicle manufacturer to be technically permissible.

3.3 **Rear underrun protective device (RUPD):** It consists of a cross-member and links to the chassis side members or other structural members of the vehicle.

3.4 **Type of RUPD**: RUPD which do not differ with respect to the essential characteristics such as shape, dimensions, attachment, materials and the marking.

3.5 **Rear Underrun Protection (RUP)** : The presence at the rear of the vehicle of either: a special RUPD or a body work, chassis parts or other components such that by virtue of their shape and characteristics, these elements can be regarded as totally or partially fulfilling the function of the RUPD.

4- REQUIREMENTS

The following shall be met:

4.1 General

4.1.1 All vehicles carrying goods, including tankers, mobile cranes, mobile workshops, trailers and semi-trailers shall be equipped with rear underrun protective devices to protect against underrunning of vehicles in the event of rear collision with passenger cars, multi-purpose vehicles and light duty trucks having a maximum mass not exceeding 3.5 tonnes.

4.1.2 The rear underrun protective device shall comply with the requirements specified in item 4.2.

4.1.3 If the vehicle is so designed and equipped at the rear that by virtue of their shape and characteristics, its component parts comply with the requirements specified in items 4.2 and 4.3, then the vehicle may not be necessary to be provided with rear underrun protective device.

4.1.4 The maximum mass of a vehicle type for which the rear underrun protective device to be installed shall not exceed the value indicated on the rear underrun protective device for which it is designed for.

4.2 **RUPD Technical requirement**

4.2.1 The section height of the RUPD member shall not be less than 100 mm.

4.2.2 The lateral extremities of the cross-member shall not bend to the rear or shall not have a sharp outer edge. This requirement can be considered as complied if the lateral extremities of the cross member are rounded on the outside and have a radius of curvature of not less than 2.5mm.

4.2.3 In case, if the rear underrun protective device is designed to have several positions at the rear of the vehicle, there must be a guaranteed method of securing it in the service position, and the force applied by the operator to vary the position of the device shall not exceed 40 daN.

4.2.4 The rear underrun protective device shall offer adequate resistance to forces applied parallel to the longitudinal axis of the vehicle.

4.2.5 When a horizontal force of 100 kN is applied to the rear underrun protective device, the distance between the rear of the rear underrun protective device and the rear extremity of the vehicle shall not exceed 400 mm at any of the points where the test forces are applied.

4.2.6 For vehicles fitted with a platform lift at the rear, the underrun device may be interrupted for the purposes of the mechanism. In this case, the following special requirements apply:

4.2.6.1 The maximum lateral clearance measured between the elements of the underrun device and the elements of the platform lift, which move through the interruption when the lift is operated and which make the interruption necessary, may amount to no more than 2.5 cm.

4.2.6.2 The individual elements of the underrun protection, including those outboard of the lift mechanism, where provided, must have an effective surface area, in each case, of at least 350 cm2. However, in the case of vehicles having a width of less than 2000 mm and where it is impossible to achieve the above requirement, the effective surface may be reduced on the condition that the resistance criteria are met.

4.3 **Installation of RUPD indicated in item 4.2 to the vehicle**

4.3.1 The ground clearance with respect to the underside of the protective device, even when the vehicle is unladen shall not exceed 550 mm over its entire width.

4.3.2 The height above the ground of the points of application of the test forces applied to the device shall not exceed 600 mm.

4.3.3 The width of the rear underrun protective device shall not at any point exceed the width of the rear axle measured at the outermost points of the wheels.

4.3.4 The width of the rear protective device shall not be more than 100 mm shorter on either side than the width of the rear axle measured at the outermost points of the wheels.

4.3.5 The device shall be so fitted that the horizontal distance between the rear of the device and the rear extremity of the vehicle, including any platform lift mechanism, shall not exceed 400 mm measured at any of the points where the test forces have been applied. In measuring this distance, any part of the vehicle which is more than 2 m above the ground when the vehicle is unladen shall be excluded.

4.3.6 The maximum mass of vehicle type for which the RUPD is installed shall not exceed the value indicated on the RUPD or with the approved document.

4.4 Requirements for Rear Underrun protection (RUP)

4.4.1 The ground clearance with respect to the underside of the RUP, even when the vehicle is unladen, shall not exceed 550 mm over its entire width.

4.4.2 The RUP shall be situated as close to the rear of the vehicle as possible.

4.4.3 The width of the RUP shall not at no point exceed the width of the rear axle measured at the outermost points of the wheels.

4.4.4 The width of the rear protective device shall not be more than 100 mm shorter on either side than the width of the rear axle measured at the outermost points of the wheels.

4.4.5 Where the device is contained in or comprised by the vehicle bodywork which itself extends beyond the width of the rear axle the requirement that the width of the RUP must not exceed that of the rear axle shall not apply.

4.4.6 The section height of the RUP shall not be less than 100 mm.

4.4.7 The lateral extremities of the RUP shall not bend to the rear or have a sharp outer edge. This requirement can be considered as complied when the lateral extremities of the RUP are rounded on the outside and have a radius of curvature of not less than 2.5 mm.

4.4.8 In case, if the rear underrun protection device (RUP) is designed to have several positions at the rear of the vehicle, there must be a guaranteed method of securing it in the service position, and the force applied by the operator to vary the position of the RUP shall not exceed 40 daN.

4.4.9 The RUP shall offer adequate resistance to forces applied parallel to the longitudinal axis of the vehicle and be connected, when in the service position, with the chassis side-members or whatever replaces them.

4.4.9.1 This requirement will be considered satisfied if it is shown that both during and after the application of the horizontal forces described in item 6.3, the horizontal distance between the rear of the RUP and the rear extremity of the vehicle, including any platform lift mechanism, does not exceed 400 mm at any of the points where the test forces are applied.

4.4.9.2 In measuring this distance, any part of the vehicle which is more than 2 m above the ground when the vehicle is unladen shall be excluded.

4.4.10 For vehicles fitted with a platform lift at the rear, the underrun device may be interrupted for the purposes of the mechanism. In this case, the following special requirements shall apply:

4.4.10.1 The maximum lateral clearance measured between the elements of the underrun device and the elements of the platform lift, which move through the interruption when the lift is operated and which make the interruption necessary, may amount to no more than 2.5 cm.

4.4.10.2 The individual elements of the underrun protection, including those outboard of the lift mechanism, where provided, shall have an effective surface area, in each case, of at least 350 cm2.

4.4.10.3 In the case of vehicles having a width of less than 2 000 mm and where it is impossible to achieve the above requirement, the effective surface area may be reduced on the condition that the resistance criteria are met.

5- MARKING

5.1 Each rear underrun protective device shall be legibly and durably marked or labelled with the following information in Arabic and/or English.

5.1.1 Manufacturers name and/or trademark.

5.1.2 Date of manufacture.

5.1.3 The maximum mass of vehicle on which the rear underrun protective device may be installed.

5.1.4 A detailed description with sketches the correct installation and adjustment of the device.

5.1.5 Drawings, diagrams and layout plans of the components of the structure.

6- TESTING

6.1 Sampling

A sufficient number of rear underrun protective device shall be taken from the consignment of the devices of the same type and subjected to the required tests prescribed in this standard.

6.2 Measuring instruments

6.2.1 Dimension measuring instrument

The instruments used shall permit measurement to an accuracy of (± 1) mm.

6.2.2 Force measuring instruments

The instruments used shall permit measurement to an accuracy of ± 5% of the range.

6.3 Tests

The following tests shall be carried out on the sample withdrawn in accordance with item 6.1.

6.3.1 Visual inspection test

The rear underrun protective device shall be visually examined to check for any damage, crack, sharp outer edge or any apparent defects.

6.3.2 Test conditions for RUPD

The test may be carried out either:

6.3.2.1 - On a vehicle of the type for which RUPD is intended

6.3.2.2 - On a part of the chassis of the vehicle type for which the RUPD is intended, this part shall be representative of the vehicle type in question

6.3.2.3 - On a rigid test bench

6.3.3 Test conditions for vehicles.

- The sample shall be installed on to a vehicle of the type for which the rear underrun protective device is intended or part of the chassis or on a rigid bench.
- The vehicle shall be at rest on a level, flat, rigid and smooth surface.
- The front steered wheels shall be in the straight-ahead position.
- The vehicle shall be unladen.
- The tyres shall be inflated to the pressure recommended by the vehicle manufacturer.
- The vehicle shall be restrained by a suitable method as specified by the manufacturer to or restrained by any method specified by the manufacturer.
- If the rear underrun protective device is installed to a trailer, the trailer shall be coupled to the tractor.
- Vehicles equipped with hydropneumatic, hydraulic or pneumatic suspension or a device for automatic leveling according to load shall be tested in the normal running condition specified by the manufacturer.

6.3.4 Procedure

The measurements shall be made on the rear underrun protective device installed in accordance with item 6.3.2 and the compliance with items 4.2, 4.3 and 4.4 shall be checked.

6.3.5 Strength test

6.3.5.1 Apparatus

The apparatus shall consists of a suitable mandrel of maximum height 250 mm, 200 mm wide, with a radius of curvature of (5 ± 1) mm at the vertical edges.

6.3.5.2 Preparation for the test

The vehicle shall be prepared for the tests as explained in item 6.3.3.

6.3.5.3 Procedure

6.3.5.3.1 The test vehicle shall be positioned on a horizontal flat surface.

6.3.5.3.2 The height of the mandrel shall be adjusted so that the height above the ground of the centre of the impact surface shall not exceed 600 mm.

6.3.5.3.3 A horizontal force of 100 kN or 50% of the force generated by the maximum mass of the vehicle, whichever is the lesser, shall be applied consecutively to two points situated symmetrically about the centre line of the device or of the vehicle whichever is applicable at a distance of (700 to 1000) mm.

6.3.5.3.4 In the cases defined in items 6.3.2.1 and 6.3.2.2 a horizontal force of 50 kN or 25% of the force generated by the maximum mass of the vehicle, whichever is the lesser, shall be applied consecutively to two points located (300 ± 25) mm from the longitudinal planes tangential to the outer edges of the wheels on the rear axle and to a third point located on the line joining these two points, in the median vertical plane of the vehicle.

6.3.5.3.5 In the cases defined in item 6.3.2.1 a horizontal force of 50 kN or 25 per cent of the force generated by the maximum mass of the vehicle for which the device is intended, whichever is the lesser, shall be applied consecutively to two points located by the manufacturer of the rear underrun protective device and to a third point located on the line joining these two points, in the median vertical plane of the device.

6.3.5.4 Replacement force application points:

If any point defined under item 6.3.5.1, is located within the interruption area of the underrun protection device as mentioned in paragraphs item 4.2.6 or 4.4.10 of this Regulation, the test forces shall be applied at replacement points located:

6.3.5.4.1 for the requirement under item 6.3.5.3.3, on the horizontal centerline and within 50 mm of each vertical edge closest to the intended points of force application, as defined in that paragraph, and

6.3.5.4.1 for the requirement under paragraph item 6.3.5.3.4, at the intersection of the horizontal and vertical centerlines of each element furthest from the vertical centerline of the device or of the vehicle, whichever is applicable. These

points should be a maximum of 325 mm from the longitudinal planes tangential to the outer edges of the wheels on the rear axle.

6.3.5.5 Result

At the end of each test the distance between the rear of the rear underrun protective device and the rear extremity of the vehicle at any of the points shall be measured.

7- CRITERIA OF TECHNICAL CONFORMITY

7.1 The criteria of technical conformity shall be in accordance with the Gulf Standard G.S. 48/1984 “Motor Vehicles - Conformity Certificates”.

7.2 The rear underrun protective device shall be considered complying with all the requirements of this standard when the withdrawn sample from the consignment or the supplied sample by the manufacturer passes the tests.

7.3 In case one or more rear underrun protective device in the sample fails to pass the tests, a second sample double the number of units as the first one shall be withdrawn from the same consignment or the supplied sample and subjected to the tests.

The rear underrun protective device shall be considered complying with the requirements of this standard when all the units of the second sample pass the tests, otherwise the rear underrun protective device shall be considered non-complying.